

REMARKS / ARGUMENTS

In response to the office action of February 27, 2009, Applicants have amended claims 1, 3-9, 11-12 and 20, canceled claims 2, 10, 16-19 and 21-31, and added new claims 32-36, which when considered with the following remarks, is deemed to place the present application in condition for allowance. Favorable consideration of all pending claims is respectfully requested. Applicants acknowledge the rejoining of groups I-VI in this application and the withdrawal from consideration of claims 16-19 and 24-31.

The disclosure has been objected to as allegedly not being in compliance with 37 C.F.R. 1.182. In particular, several sequences depicted in Figure 7 do not have sequence identifiers. By this amendment, the Description of the Figures has been amended so that Figure 7 specifically lists sequence identifiers. In addition, the Sequence Listing has been amended so that the sequences in Figure 7 are now part of the sequence listing. Withdrawal of the objection is therefore respectfully requested.

Claims 1-15 and 20-22 have been objected to because such claims do not begin with an article. By this amendment, the claims begin with an article. Claim 5 is also objected to due to the word "any". As presently amended, claim 5 recites in relevant part: "A method according to claim 3". Claim 20 has been objected to as not complying with 37 C.F.R. 1.182 which requires that reference be made to a sequence by use of the sequence identifier. As presently amended, claim 20 recites in relevant part: "SEQ ID NO:9 having at least one of a Y substituted for an H at position 4, V substituted for a D at position 79 or an A substituted for a T at position 152; SEQ ID NO:10 having an I substituted for a T at position 30; or SEQ ID NO:11 having at least one of an E substituted for a V at position 5, an R substituted for an S at position 122, or a K substituted for an E at position 143". Withdrawal of the objection to claims 1-15 and 20-22 is therefore respectfully requested.

Claim 1 and claims 3-6 and 9-15 dependent thereon, have been rejected under 35 U.S.C. 112, second paragraph, as allegedly incomplete for omitting essential steps, such omission amounting to a gap between the steps. As presently amended, claim 1 recites six separate steps. Withdrawal of the rejection is therefore warranted.

Claim 21 and claim 22 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly omitting essential elements, such omission amounting to a gap between the elements. By this amendment, claims 21 and 22 have been canceled.

Claim 1 and claims 3-6 and 9-15 have been rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner has objected to recitation of "increasing". By this amendment, claim 1 no longer recites "increasing". Withdrawal of the rejection is therefore warranted.

Claim 4 and claim 10 dependent thereon, have been rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. In particular, the recitation of "the nucleic acid sequence" has been found to lack antecedent basis. As presently amended, claim 4 no longer recites "the nucleic acid sequence". Withdrawal of the rejection is therefore respectfully requested.

Claim 6 and claims 9 and 15 dependent thereon, have been rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, claim 6 has been deemed indefinite for reciting "wherein said B-type CDK is a class 2 B-type CDK" because claim 6 depends from claim 5 which claim limits the B-type CDK to class 1 B-type CDKs. By this amendment, claim 6 has been amended to depend from claim 3. Withdrawal of the rejection is therefore warranted.

Claims 7-9 have been rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for failing to particularly claim the subject matter which applicant regards as the invention. In particular, the recitation of "is as represented by" is objected to. By this amendment, claims 7-9 recite in relevant part: "has the amino acid sequence of" rather than "is as represented by". Withdrawal of the rejection is therefore respectfully requested.

Claim 12 has been rejected as allegedly indefinite since claim 12 depends from claim 5 which limits the B-type CDK to class 1 B-type CDKs and because there is no antecedent basis for "said CDK B2;2" in claim 12. By this amendment, claim 12 has been amended to also depend from claim 6, which claim provides antecedent basis for "said CDK B2;2" in claim 12.

Claim 20 has been rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite for reciting a B-type CDK "gene/nucleic". By this amendment, claim 20 no longer recites "gene/nucleic acid molecule". Withdrawal of the rejection is respectfully requested.

Claims 3, 5-9, 11-12 and 15 have been rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. According to the Examiner, the specification does not describe any B-type CDK nucleic acid or protein derived from algal or fungal sources. In response to the rejection, and in order to advance prosecution of this application, claim 3 has been amended to recite that the B-type CDK is derived from a plant. Withdrawal of the rejection of claims 3, 5-9, 11-12 and 15 under the written description requirement of section 112, first paragraph, is therefore warranted.

Claims 7-10 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. It is the position of the Examiner that the specification does not describe B-type CDK nucleic acids or proteins that are variant nucleic acids or variant proteins and that are functional portions, alternative splice variants, allelic variants, homologues, derivatives, and active fragments, and mutants. In order to advance prosecution of this application, claims 7-9 have been amended so that the language "or a homologue, derivative or active fragment" is no longer recited. Claim 10 has been canceled without prejudice. Withdrawal of the rejection of claims 7-10 under the written description requirement of 35 U.S.C. §112, first paragraph is therefore respectfully requested.

Claims 11-12 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. Claim 11 is directed to a method that employs a beta expansin promoter and claim 12 is directed to a method that employs a GOS2 promoter. The position of the Examiner is that the specification describes a single beta expansin promoter having the nucleotide sequence of SEQ ID NO:14 obtained from *Oryza sativa* and a single GOS2 promoter having the nucleotide sequence of SEQ ID NO:15 obtained from *Oryza sativa*. According to the Examiner, the specification does not describe other beta expansin promoters or other GOS 2 promoters.

In order to advance prosecution of this application, claim 11 has been amended so that it no longer recites a beta expansin promoter and claim 12 has been amended so that it no longer

recites a GOS2 promoter. In addition, new claim 35 depends from claim 11 and recites a beta expansin promoter having the nucleotide sequence of SEQ ID NO:14. New claim 36 depends from claim 12 and recites a GOS2 promoter having the nucleotide sequence of SEQ ID NO:15. In view of the foregoing, withdrawal of the rejection of claims 11-12 under 35 U.S.C. §112, first paragraph, is respectfully requested.

Claims 1-5, 7, 10-14 and 20-21 have been rejected under 35 U.S.C. 102(b) as allegedly anticipated by Inze D. et al. (WO 98/41642, published September 24, 1998). Inze et al. is relied upon for allegedly teaching a method comprising increasing expression in a plant of a nucleic acid encoding a B-type CDK protein and /or increasing activity and/or levels in a plant of a B-type CDK protein wherein said increasing expression is effected by introducing and expressing in a plant a CDC2bAt nucleic acid (pages 38-40). Inze et al. has also been cited for allegedly teaching a method wherein said increasing expression is effected by introducing and expressing in a plant a B-type CDK nucleic acid derived from *Arabidopsis thaliana* wherein said B-type CDK is a mutant variant, i.e., Cdc2bAt-DN (pages 38-40). Use of the triple-op promoter (Top3) to drive expression of a B-type CDK, is also a teaching attributed to Inze et al.

In response to the rejection, Claim 1 has been amended to recite specific steps which steps are not taught by Inze et al. As presently amended, claim 1 recites:

A method for improving plant growth characteristics selected from one or more of increased yield, increased growth rate and modified architecture, said method comprising:

- (a) introducing into a plant a nucleic acid molecule encoding a B-type CDK protein said CDK protein comprising a PPTALRE (SEQ ID NO:26) motif with no mismatches or with a mismatch at position 2 and/or 4 from left to right, a catalytic kinase domain, and a T-loop activation kinase domain, to obtain T0 transformants;
- (b) growing the T0 transformants to obtain T1 seed;
- (c) germinating the T1 seed to obtain T1 plants;
- (d) selecting T1 plants or progeny thereof comprising the nucleic acid molecule encoding the B-type CDK protein;
- (e) measuring in a T1 selected plant or progeny thereof of step (d), a parameter selected from the group consisting of: aboveground plant area; plant height; panicle number, total seed

number; number of filled seeds; total weight of seeds; harvest index; or thousand kernel weight;

(f) correlating an increase in a parameter of step (e) in a T1 plant or progeny thereof compared to a control plant, with a plant having increased yield, increased growth rate or modified architecture.

Support for the amendments to claim 1 may be found throughout the specification, e.g., Example 7 and page 25 of the specification (paragraph [0110] of the published application. It is respectfully submitted that Inze et al. do not teach the presently claimed method. Example 15 of Inze et al. teach expression and analysis of CDC2bAt and CDc2bAt-DN in transgenic tobacco lines which consisted of Western blotting transformants, selecting two lines from each transformation with the highest level of expression for further analysis. Further analysis consisted of immunoprecipitation and detection of a specific peptide derived from CDC2bAt with an antibody. Overexpression of CDC2bDN resulted in a strong reduction of the kinase activity. Examination of the roots of transgenic plants by confocal microscopy indicated that plants overexpressing CDC2bDN had considerably enlarged nuclei. Flow cytometry indicated that lines overexpressing CDC2b as well as lines expressing the dominant mutants of CDC2b, had increased nuclear DNA content (endoreduplication).

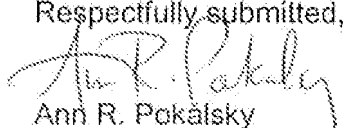
In contrast, the presently claimed invention is directed to a method for increasing yield, increasing growth rate or modifying plant architecture. The method comprises distinct steps including growing T0 plants transformed with a B-type CDK protein to obtain T1 seed, germinating the T1 seed to obtain T1 plants, selecting T1 plants comprising the nucleic acid molecule encoding the B-type CDK protein, measuring in a T1 selected plant a specific parameter such as above-ground plant area, plant height, panicle number, total seed number, number of filled seeds, total weight of seeds, harvest index, or thousand kernel weight. None of these steps are taught by Inze et al. Nor does Inze et al. teach the step of correlating an increase in any of such parameters, with a plant having increased yield, increased growth rate or modified architecture. The presently claimed invention is therefore distinguished from the teachings of Inze et al., and withdrawal of the rejection of claims 1-5, 7, 10-14 and 20-21 under 35 U.S.C. §102(b) as allegedly anticipated by Inze is warranted.

Claims 6, 8-9 and 15 have been rejected as allegedly obvious over Inze et al. in view of Boudolf V. et al. "Identification of novel cyclin-dependent kinases interacting with the CKS1 protein of *Arabidopsis*." *J. Exp Bot.* 2001 June; 52(359):1382-2. The Examiner acknowledges that Inze et al. do not teach the B-type CDK CDKB1;2 or CDK B2;2 as set forth in Applicants' SEQ ID NO:3 or 5 or by a portion thereof, or by a nucleic acid sequence capable of hybridizing therewith, as represented d by SEQ ID NO: 4 or 6 or a homologue, derivative or active fragment thereof, or a transgenic monocotyledonous plant. Boudolf V. et al. is relied upon for teaching the B-type CDK, CDK B1;2 and CDK B2;2 as represented by SEQ ID NO: 3 or 5 or by a portion thereof, or by a nucleic acid sequence capable of hybridizing therewith, and as represented by SEQ ID No:4 or 6 or a homologue, derivative or active fragment thereon (page 1382 Table 1). It is the position of the Examiner that since Inze et al. teach that the expression in a plant of a nucleic acid encoding a B-type CDK protein and/or the levels in a plant of a B-type CDK protein can be increased by transforming a plant with a CDC2bAt nucleic acid encoding a B-type CDK, it would have been *prima facie* obvious to one of skill in the art at the time the invention was made, to substitute another nucleic acid encoding another B-type CDK for the CDC2bAt nucleic acid used by Inze et al., such as the nucleic acids encoding the B-type CDKs CDKB1;2 and CDK B2;2 as taught by Boudolf et al.

Applicants traverse the rejection for the following reasons. Inze et al. is mainly concerned with the isolation of a new gene product that *interacts* with CDC2aAt, designated CKS1At, for CDK-associating subunit from *Arabidopsis thaliana*. CKS1At transformed plants show modulated endoreduplication. Inze et al. also disclose that CDC2bAt and a dominant negative mutant of a plant CDC2b may be used to modulate endoreduplication in plant cells. The combination of Inze et al. in view of Boudolf et al. does not render the present invention obvious since the teachings provided therein do not suggest the presently claimed method of improving plant growth characteristics selected from one or more of increased yield, increased growth rate and modified architecture comprising steps (a) through (f) as presently claimed. Withdrawal of the rejection of claims 6, 8-9 and 15 under 35 U.S.C. §103(a) is therefore respectfully requested.

In view of the foregoing remarks and amendments, it is believed that the present application is in condition for allowance, which action is earnestly solicited.

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